



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

REDACTED VERSION

June 18, 2015

SENT VIA CERTIFIED MAIL: 7014 0150 0000 2453 9858

(b) (6)

RE: Request for Property Access
Wilcox Oil Company Superfund Site

Dear (b) (6)

My name is Katrina Higgins-Coltrain, and I am the new Environmental Protection Agency (EPA) project manager for the Wilcox Oil Company Superfund Site (Site). I have been working with Todd Downham of the Oklahoma Department of Environmental Quality to get a better understanding of the Site as well as the concerns of the community.

It is my understanding that you own property just across the street from the Wilcox Oil Company Superfund Site and may have concerns about the Site and your property. It is my understanding that Todd has talked with you briefly about the Site and our interest in sampling and investigating your property. I am sending this letter to request access for your property, so that we can sample and investigate your property while we sample and investigate the Wilcox Oil Company Superfund Site. You may be familiar with the recent residential sampling and fencing effort we completed in the neighborhood near your property.

In order to sample your property for the presence of potential contamination as a result of refinery operations, we will need a signed consent for access. I have enclosed a blank access agreement for your review. As you look over the access agreement, you will notice that it will give us access to sample your property, analyze those samples in a laboratory, take a cleanup action to protect human health and the environment, and photograph the samples and locations. Although you may provide us access, we will coordinate our efforts with you and explain our plans and sampling procedures prior to accessing your property. We will work closely with you while we plan and perform this work. Please also note that the access you grant to us is voluntary, and you may revoke it at any time. You may either sign and send the document by mail to my attention at the address listed below, or if there is another option you prefer, please let us know. We are in the area regularly and may be able to meet you.

Also enclosed with this letter, please find some Site literature that describes the Site and also describes the Superfund Process. I have also included some health fact sheets (ATSDRToxFAQs) on the contaminants we know to be present at the Site.

There are also internet resource links about the Site.

<http://www.epa.gov/earth1r6/6sf/6sf-ok.htm>

<http://www.deq.state.ok.us/lpdnew/SF/Superfund%20Project/SF%20Site%20Summaries/WilcoxRefinery.html>

I have been working closely with Todd Downham of the Oklahoma Department of Environmental Quality. Please do not hesitate to call me at 21-665-8143 or 1-800-533-3508, or call Todd Downham, ODEQ, at 405-702-5136, should you have questions or concerns about the Site or your property. Thank you for your time, and I look forward to talking with you.

Sincerely,



Katrina Higgins-Coltrain
Remedial Project Manager
LA/OK/NM Section

Cc: Todd Downham, Oklahoma Department of Environmental Quality
Marvin Benton, Environmental Protection Agency

Enclosures (6)

RETURN ADDRESS:

Katrina Higgins-Coltrain
Remedial Project Manager
US Environmental Protection Agency
LA/OK/NM Section (6SF-RL)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202



United States Environmental Protection Agency Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202

Consent for Entry and Access to Property

Name: _____

Address: _____

Phone: (_____) _____

Address of Property for which consent to access is granted:

Relationship to property: _____
(i.e., owner, 5-year tenant, etc.)

I consent to officers, employees, and authorized representatives of the United States Environmental Protection Agency (EPA) entering and having continued access to my property for the following purposes:

1. Taking such soil, water, air, and/or other samples upon the property as may be determined to be necessary;
2. Performing physical tests to determine the characteristics of the soil and aquifer(s) beneath the property;
3. Sampling of any solids or liquids stored or disposed of on the property, or any containers, tanks, materials or other items suspected to contain hazardous substances located upon the property, including the removal of such materials if necessary to perform laboratory testing;
4. Taking a response action to mitigate any threat to human health and/or the environment at the property, including site stabilization and mitigation activities, and the removal, cleanup, elimination and/or remediation of hazardous substances or any materials containing hazardous substances.
5. Photographing and videotaping the property for documentation of current conditions;
6. Other actions necessary to determine the nature, extent and potential threat to human health and the environment from contamination at the property or the removal of such threat at or originating from the property.

I realize that these actions by EPA are undertaken pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq.

To the extent that EPA installs any item, I acknowledge that it makes no representations about the quality, aesthetics, safety, use, or character of the item or its installation; and makes no warranties as to the item or its installation.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

I certify that this Consent for Entry and Access is entered into voluntarily and constitutes an unconditional consent and grant of permission for access to the property by officers, employees and authorized representatives of EPA at reasonable times.

All statements on this document are true and correct to the best of my knowledge.

Date:_____ Signature_____



Current Information on the Wilcox Oil Superfund Site and Open House Meeting

Bristow, Oklahoma

May, 2015

This fact sheet will tell you about:

- **Open House Meeting**
- **Current Actions at the Wilcox Oil Superfund Site (Site)**
- **The National Priorities List**
- **The Superfund Process**
- **Site History**
- **Contacts and More Information**

Open House Meeting

The Environmental Protection Agency (EPA) and Oklahoma Department of Environmental Quality (ODEQ) will host an Open House. This Open House will provide an opportunity for you to get up to date information about the site and planned activities, meet one-on-one with Agency staff, and discuss your questions or concerns.

This is a come-and-go event that will last from 4:00 p.m. to 6:00 p.m. You can spend as little or as much time as you wish at the Open House. There will be no "sit-down" formal technical presentations or group question and answer period. Posters, maps, handouts, and interactive computer information will be available.

OPEN HOUSE MEETING

May 19, 2015 4 to 6 PM

Bristow-Public Library

111 West 7th Street

Bristow, Oklahoma 74010

Current Actions at the Site

The EPA and ODEQ met with residents on March 24 and 25, 2015, to talk about the Wilcox Oil Superfund Site. During these meetings, residents expressed interest in having their properties sampled. As a result, the EPA and ODEQ will be in the area sampling residential properties in May 2015 and fencing additional areas of concern.

The residential sampling is being done to compliment other activities that have been taken.

- In July 2014, the EPA installed a cap on the drinking water well near the Church on the Site and put up a fence with signs around an area of concern.
- In November 2014, ODEQ informed EPA that there was a potential elevated level of lead in the blood of a child living on the Site. The EPA developed a sampling plan and sampled the property in December 2014. A small area near a former pit was identified as a concern and will be fenced in May 2015.
- Currently ODEQ is performing quarterly testing of drinking water wells for residents in and around this Site and nothing was found above the Maximum Contaminant Levels (MCLs).

The National Priorities List

The National Priorities List, or NPL, is a list of top priority sites to be addressed through the Superfund Law. Initially, 406 sites were



listed when established in 1983; currently more than 1,685 sites are identified.

The EPA and the states continue to evaluate potential future sites. With the current rulemaking announcement, the EPA added the Site to the NPL on December 12, 2013.

The Superfund Process

The Superfund cleanup process begins with site discovery or notification to EPA of possible releases of hazardous substances. Sites are discovered by various parties, including citizens, State agencies, and EPA Regional offices. EPA then evaluates the potential for a release of hazardous substances from the site through a step-by-step process that includes site assessment, site inspections, and a ranking process to determine whether the site should be added to the NPL. Once on this list, EPA determines the best way to clean up the site to protect human health and the environment. Opportunities for community involvement occur throughout the process.

Site History

The Site is an inactive and abandoned oil refinery located in Bristow, Creek County, Oklahoma. Wilcox Oil Company operated the oil refinery from the 1920s until the mid-1960s. The area of the former refinery is approximately 125 acres.

Contacts and More Information

Repository

City of Bristow Public Library
111 West 7th Street
Bristow, OK 74010

Mark Hayes

EPA Removal On-Scene Coordinator
214.665.2705 or 1.800.533.3508 (toll-free)
Hayes.Mark@epa.gov

Katrina Higgins-Coltrain

EPA Remedial Project Manager
214.665.8143 or 1.800.533.3508 (toll free)
coltrain.katrina@epa.gov

Bill Little

EPA Community Involvement Coordinator
214.665.8131 or 1.800.533.3508 (toll free)
Little.Bill@epa.gov

Janetta Coats

TAG Coordinator
214.665.7308 or 1.800.533.3508 (toll free)
Coats.Janetta@epa.gov

Captain Patrick Young

U.S. Public Health Service
ATSDR Regional Representative
214.665.8562 or 1.888.422.8737 (toll free)
Young.patrick@epa.gov

Todd Downham

Oklahoma Department of Environmental Quality
405.702.5136
Todd.Downham@deq.ok.gov

Amy Brittain

Oklahoma Department of Environmental Quality
405.702.5157
Amy.Brittain@deq.ok.gov

*For additional information, please consult the EPA Region 6 website:
<http://www.epa.gov/region6/6sf/6sf-ok.htm>.*

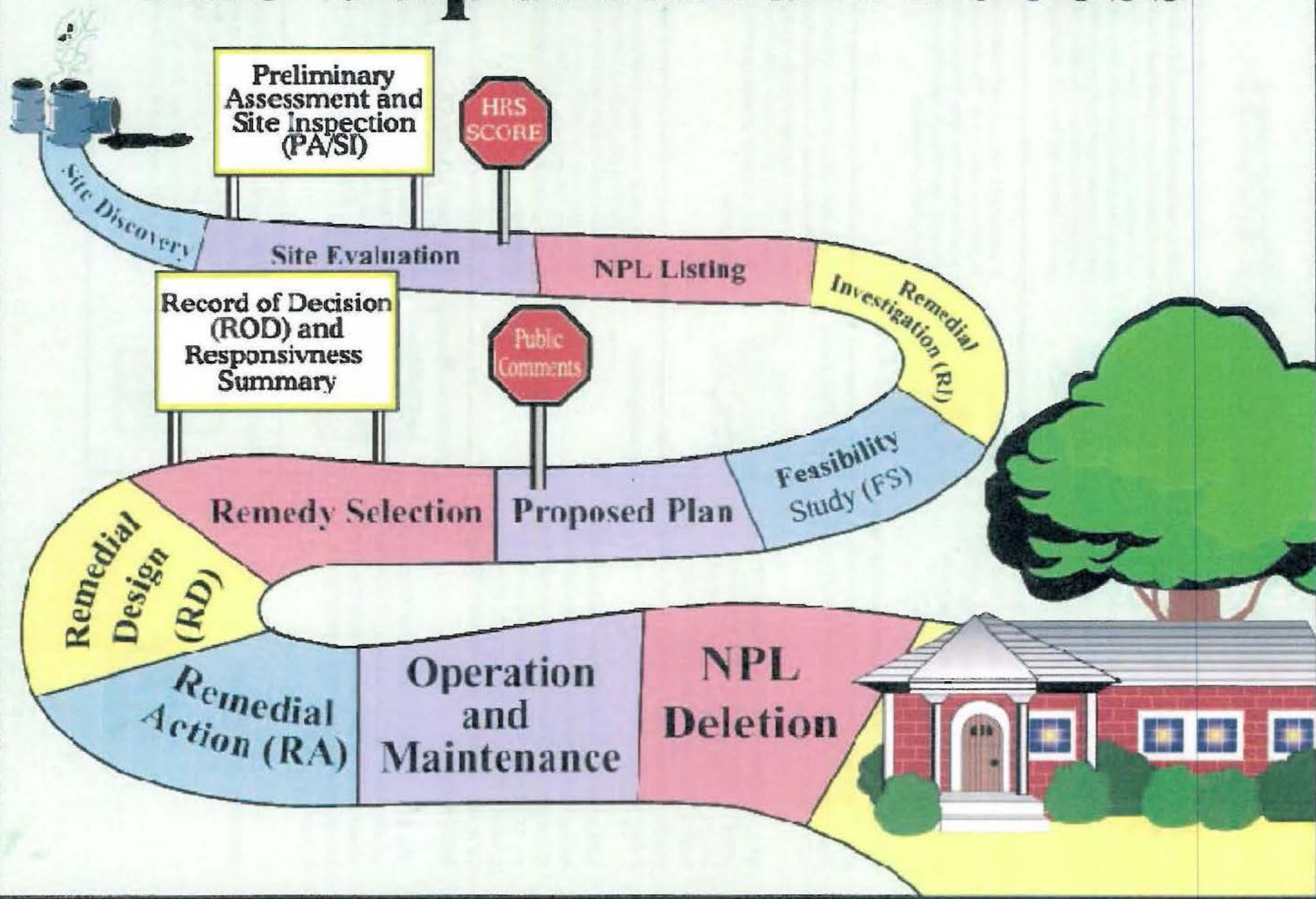
All inquiries from the news media should be directed to: EPA Region 6 Press Office at 214.665.2200.



United States
Environmental Protection
Agency

Region 6
1445 Ross Ave. (6SF-VO)
Dallas, TX 75202

The Superfund Process



The Superfund Process

The Superfund program was enacted by Congress in December 1980. The law established a program to investigate and initiate actions against actual and potential releases of hazardous chemicals and other substances at sites throughout the United States. In 1986, Congress reauthorized Superfund and increased the size of the fund from \$1.6 billion to \$8.5 billion. The U.S. Environmental Protection Agency (EPA) administers the Superfund program in cooperation with individual states.

The Superfund process can differ from each site. There are usually six phases which begin when a site is identified and concluded with a final remedy.

EPA monitors the site throughout the process. If at any time contamination becomes an immediate threat to public health or the environment, EPA may conduct an emergency action, known as a removal action.

EPA attempts to identify parties who may be legally responsible for site contamination. Once identified, these parties are asked to participate in the investigation and remedial process. If they do not agree to participate, EPA may seek their participation through legal means.

The EPA Region 6, Superfund Program has established a toll free number to provide direct access to the general public and to increase community involvement in the Superfund Program.

Just dial 1-800-533-3508



Identification



Before most people understood how certain wastes might threaten public health and the environment, hazardous wastes were often disposed of at locations where they could either enter the ground, water, or air. Now these sites are being brought to the attention of EPA by private citizens, and local and state agencies.

Assessment



A preliminary inspection of the site is conducted by EPA or a state agency. The site is assessed for the presence of hazardous chemicals and other substances and their potential impact on public health or the environment.

NPL Placement



If EPA finds that a site poses a serious actual or potential threat to the community, the site is placed on the National Priorities List (NPL), a roster of the nation's worst hazardous waste sites. The NPL currently includes more than 1,100 sites nationwide.

Investigation



EPA conducts a two-part investigation of all NPL sites. The first part, a remedial investigation, identifies contamination and site-related threats to the environment and public health. The second part of the investigation, a feasibility study, evaluates various approaches to addressing site conditions.

Preferred Remedy



EPA selects a preferred remedy for the site from among the alternatives presented in the feasibility study. After EPA recommends its choice, the public, state and local officials are given an opportunity to comment on it. After it considers the comments, EPA selects the final remedy for the site.

Final Remedy



Following the selection of a final remedy, EPA designs and implements the chosen remedy. EPA negotiates with parties responsible for contamination of the site to design, implement and pay for the final remedy. EPA may, through legal action, later recover costs from the responsible parties.

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

What happens to lead when it enters the environment?

- ☐ Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- ☐ When lead is released to the air, it may travel long distances before settling to the ground.
- ☐ Once lead falls onto soil, it usually sticks to soil particles.
- ☐ Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

How might I be exposed to lead?

- ☐ Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.

- ☐ Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.

- ☐ Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.

- ☐ Using health-care products or folk remedies that contain lead.

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

(DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

How can families reduce the risks of exposure to lead?

- ☐ Avoid exposure to sources of lead.
- ☐ Do not allow children to chew on mouth surfaces that may have been painted with lead-based paint.
- ☐ If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- ☐ Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children.
- ☐ If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces

often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter ($\mu\text{g/dL}$). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC considers a blood lead level of 10 $\mu\text{g/dL}$ to be a level of concern for children.

EPA limits lead in drinking water to 15 μg per liter.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



Polycyclic Aromatic Hydrocarbons (PAHs) - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl'ī-sī'klīk ār'ə-măt'īk hī'drə-kar'bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.

- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.
- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

Polycyclic Aromatic Hydrocarbons

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

This fact sheet answers the most frequently asked health questions (FAQs) about total petroleum hydrocarbons (TPH). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: TPH is a mixture of many different compounds. Everyone is exposed to TPH from many sources, including gasoline pumps, spilled oil on pavement, and chemicals used at home or work. Some TPH compounds can affect your nervous system, causing headaches and dizziness. TPH has been found in at least 23 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are total petroleum hydrocarbons?

(Pronounced tōt'l pə-trō'lē-əm hī'drə-kär'bənz)

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is used to make petroleum products, which can contaminate the environment. Because there are so many different chemicals in crude oil and in other petroleum products, it is not practical to measure each one separately. However, it is useful to measure the total amount of TPH at a site.

TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals.

Some chemicals that may be found in TPH are hexane, jet fuels, mineral oils, benzene, toluene, xylenes, naphthalene, and fluorene, as well as other petroleum products and gasoline components. However, it is likely that samples of TPH will contain only some, or a mixture, of these chemicals.

What happens to TPH when it enters the environment?

- ☐ TPH may enter the environment through accidents, from industrial releases, or as byproducts from commercial or private uses.
- ☐ TPH may be released directly into water through spills or leaks.
- ☐ Some TPH fractions will float on the water and form surface films.
- ☐ Other TPH fractions will sink to the bottom sediments.
- ☐ Bacteria and microorganisms in the water may break down some of the TPH fractions.
- ☐ Some TPH fractions will move into the soil where they may stay for a long time.

How might I be exposed to TPH?

- ☐ Everyone is exposed to TPH from many sources.
- ☐ Breathing air at gasoline stations, using chemicals at home or work, or using certain pesticides.
- ☐ Drinking water contaminated with TPH.
- ☐ Working in occupations that use petroleum products.
- ☐ Living in an area near a spill or leak of petroleum products.
- ☐ Touching soil contaminated with TPH.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

How can TPH affect my health?

Some of the TPH compounds can affect your central nervous system. One compound can cause headaches and dizziness at high levels in the air. Another compound can cause a nerve disorder called "peripheral neuropathy," consisting of numbness in the feet and legs. Other TPH compounds can cause effects on the blood, immune system, lungs, skin, and eyes.

Animal studies have shown effects on the lungs, central nervous system, liver, and kidney from exposure to TPH compounds. Some TPH compounds have also been shown to affect reproduction and the developing fetus in animals.

How likely is TPH to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that one TPH compound (benzene) is carcinogenic to humans. IARC has determined that other TPH compounds (benzo[a]pyrene and gasoline) are probably and possibly carcinogenic to humans. Most of the other TPH compounds are considered not to be classifiable by IARC.

Is there a medical test to show whether I've been exposed to TPH?

There is no medical test that shows if you have been exposed to TPH. However, there are methods to determine if you have been exposed to some TPH compounds. Exposure to kerosene can be determined by its smell on the breath or clothing. Benzene can be measured in exhaled air and a breakdown product of benzene can be measured in urine. Other TPH compounds can be measured in blood, urine, breath, and some body tissues.

Has the federal government made recommendations to protect human health?

There are no regulations or advisories specific to TPH. The following are recommendations for some of the TPH fractions and compounds:

The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration has set an exposure limit of 500 parts of petroleum distillates per million parts of air (500 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Immune system: Body organs and cells that fight disease.

Pesticides: Chemicals used to kill pests.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for total petroleum hydrocarbons (TPH). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

